Model Development Phase

Date	15 July 2024
Team ID	739827
Project Title	Thyroid Classification using ML
Maximum Marks	4 Marks

Initial Model Training Code, Model Validation and Evaluation Report

The initial model training code will be showcased in the future through a screenshot. The model validation and evaluation report will include classification reports, accuracy, and confusion matrices for multiple models, presented through respective screenshots.

Initial Model Training Code:

```python
from sklearn.ensemble import RandomForestClassifier
from sklearn.metrics import accuracy_score,confusion_matrix,classification_report
from sklearn.model_selection import GridSearchCV

rf = RandomForestClassifier(random_state=42, bootstrap=False, max_depth=None,
                            max_features='sqrt', min_samples_leaf=2,
                            min_samples_split=2, n_estimators=100)
rf.fit(x_train,y_train)
```

```
                        RandomForestClassifier
RandomForestClassifier(bootstrap=False, min_samples_leaf=2, random_state=42)
```

```python
x_pred=rf.predict(x_train)
y_pred=rf.predict(x_test)
```

Model Validation and Evaluation Report:

Model	Classification Report	Accuracy	Confusion Matrix

Random forest Classifier	```print(classification_report(y_test,y_pred))```
	
	`                        precision    recall  f1-score   support`
	`compensated hypothyroid    0.84      0.88      0.86        24`
	`               negative    1.00      1.00      1.00       893`
	`               accuracy                        0.99       917`
	`              macro avg    0.92      0.94      0.93       917`
	`           weighted avg    0.99      0.99      0.99       917`
		99.86%	```confusionMatrix = confusion_matrix(y_train,x_pred)```
			```print("Confusion Matrix:",confusionMatrix)```
			
			`Confusion Matrix: [[3534    0]`
			`  [  10 3524]]`